Claims

1. Method for the computer-assisted determination of an optimum-fuel control of nozzles according to a control instruction $b=Ax$, whereby

b represents a desired m-dimensional forces/torque vector,

A represents an mxn-dimensional nozzle matrix and

x represents the sought n-dimensional nozzle control vector and

the nozzle control vector should meet the minimization criterion

$$J := \sum_{i=1}^{i=n} x_i \rightarrow \min$$

wherein

- A defined matrix transformation of starting constraints for the mass flow of the nozzles and of the minimization criterion takes place in a computer-assisted manner,
- A data processing representation of a geometric description of the matrix-transformed starting constraints takes place in a computer-assisted manner,
- Through a computer-assisted geometric search procedure in the vector space, a computer-assisted determination of limiting point sets of the geometric description of the starting constraints takes place, and
- The matrix-transformed minimization criterion is applied to the points of the limiting point sets.

2. Method according to claim 1, wherein

- For the matrix transformation of the starting constraints for the mass flow of the nozzles, a homogenous solution of the control instruction according to $x_{ho}=A_o r$ is defined, whereby

A_o: represents the *n x (n-m)* dimensional zero space matrix of A and

r: represents an *(n-m)* dimensional vector of any real numbers,

- Within the scope of the use of the matrix transformation of the minimization criterion a computer-assisted calculation is made of scalar products of a vector representation of points of the limiting point set and the vector

$$v_d^T := \left[\sum_{j=1}^{n} A_{0j1} \sum_{j=1}^{n} A_{0j2} \cdots \sum_{j=1}^{n} A_{0jp} \right], p := n - m$$

and

- An optimum-fuel solution is calculated with the aid of the vector r whose scalar product is minimal with the vector v_d.

3. Method according to claim 1, wherein

- The matrix-transformed starting constraints for the mass flow of the nozzles is converted in a computer-assisted manner into allowable multi-dimensional value regions,
- To determine the limiting point sets, a formation of at least one multi-dimensional cut set of the individual allowable multi-dimensional value regions takes place, and
- The limiting point sets are determined as those point sets that limit the at least one cut set.

4. Method according to claim 3, wherein

- A repeated projection of the allowable multi-dimensional value regions of the dimension p is made on a dimension p-1, until a projection of the allowable value regions on limiting intervals of a dimension p=1 has been achieved and
- Subsequently a computer-assisted search procedure carries out a computer-assisted determination of limiting point sets as cut set of limiting intervals.

5. Computer program for the computer-assisted determination of an optimum-fuel control of nozzles according to a control instruction $b=Ax$, whereby

b represents a desired m-dimensional forces/torque vector

A represents an mxn-dimensional nozzle matrix and

x represents the sought n-dimensional nozzle control vector and

the nozzle control vector should satisfy the minimization criterion

$$J := \sum_{i=1}^{i=n} x_i \rightarrow \min$$

wherein the computer program contains

- A first program routine for the computer-assisted execution of a defined matrix transformation of starting constraints for the mass flow of the nozzles and the minimization criterion,
- A second program routine for the computer-assisted execution of a data processing representation of a geometric description of the matrix-transformed starting constraints,

- A third program routine for the computer-assisted execution of a geometric search procedure in the vector space for the computer-assisted determination of limiting point sets of the geometric description of the starting constraints,
- A fourth program routine for the computer-assisted application of the matrix-transformed minimization criterion to the points of the limiting point sets.

6. Computer program product containing a machine-readable program carrier on which a computer program according to claim 5 is stored in the form of electronically readable control signals.